

**REDESCRIPTION AND PHYLOGENETIC POSITION OF THE
UNUSUAL ALEOCHARINE STAPHYLINID *DIMONOMERA
INDICA* CAMERON, 1933 (COLEOPTERA: STAPHYLINIDAE:
ALEOCHARINAE: DIMONOMERINI)**

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Abstract.—The unusual genus and species *Dimonomera indica* Cameron, currently placed as the sole member of the tribe Dimonomerini, is redescribed, and illustrations of habitus, mouthparts, meso-metasternal areas, tarsi and male genitalia are provided. *Dimonomera* shares numerous characters, some of which are unique among aleocharines, with known members of the tribe Myllaenini. It differs from other myllaenines, especially the type genus *Myllaena*, primarily in the unusual autapomorphic tarsal structure. Tarsal structure is an insufficient criterion for establishing a tribe exclusively to include *Dimonomera*. The results of this study support the proposal that *Dimonomera* should be included in the Myllaenini.

Cameron (1933) described the genus *Dimonomera* and its single species *D. indica* Cameron, and he redescribed the genus and species in 1939 with little change. In both of these works, he noted the remarkable tarsal structure of this beetle. The tarsi of the anterior and middle legs appear to be made up of a single slender, rod-like segment which is as long as the tibia. In contrast, the tarsi of the hind legs are composed of 5, more-or-less uniformly setose segments. This is dramatically different from the tarsal structure of any other known aleocharine staphylinid. This led Cameron (1933) to propose that a new tribe, the Dimonomerini, was needed to contain this species. He mentioned that the species was similar to the genus *Myllaena* (tribe Myllaenini) in habitus, pubescence and “apparently” (Cameron 1939, p. 14) in mouthpart structure (though he did not describe the mouthparts in detail). These statements led Seevers (1978) to propose that the Dimonomerini is closely related to the tribe Myllaenini, and that *Dimonomera* should probably be placed in the Myllaenini. However, as far as I can ascertain *Dimonomera indica* is only known from the type specimen, which has not been examined in detail since it was described by Cameron. Consequently, Cameron’s statements about the similarity of the mouthparts of *Dimonomera* to those of *Myllaena*, and Seevers’ proposed placement of *Dimonomera* in the Myllaenini have not been verified or tested.

I have examined the type, and sole known specimen, of *Dimonomera indica* in the process of on-going studies of the phylogeny of the Myllaenini and related tribes by myself and Kee-Jeong Ahn. My goal in this paper is to redescribe the genus and species in detail, provide adequate illustrations of habitus and diagnostic characteristics and to evaluate Seevers’ proposed placement of *Dimonomera*.

Dimonomera Cameron, 1933

Cameron 1933, p. 103; Cameron 1939, p. 14.

Description. Body form rather flattened, fusiform, broadest at base of pronotum and elytra, abdomen tapered uniformly from broad base to more-or-less pointed apex

(Fig. 1). Head subquadrate (not including postclypeus and labrum), more or less rounded behind, eyes subequal to length of temples behind eyes in dorsal aspect, eyes not bulging or prominent, infraorbital carina complete, rather prominent; neck absent. Antenna very long, with all segments very elongate, apical antennal article without coeloconic sensillae. Labrum (Fig. 2) semicircular, covered uniformly with numerous long setae, apical margin not membranous medially, a-sensory setae short, inflated and hyaline. Adoral surface of labrum (epipharynx) as in Fig. 3. Mandibles (Fig. 4, 5) asymmetrical, right mandible with a small medial tooth, medial tooth absent from left mandible; ventral molar area without patches of denticles; "velvety patch" of dorsal molar region consisting of a transverse apical row of minute denticles and a few irregular rows of smaller denticles basal to the apical row; dorso-lateral margin with numerous setae. Maxillary palpi (Fig. 6) elongate, 4-articled; article 1 short, about $\frac{1}{6}$ as long as article 2; articles 2 and 3 elongate and subequal in length, uniformly covered with numerous microsetae; article 3 spindle-shaped, widest in apical third, and narrowed to base and apex; article 4 very short and minute, about as long as width of apex of article 3. Maxilla (Fig. 6) with galea (Fig. 6b) very elongate and slender, sclerotized to apex, with a few large sensory scales and setae at apex, mesal margin without rows of setae; lacinia (Fig. 6a) elongate and slender, apical third with widely dispersed spinose setae emerging from sockets between spinose scales, middle third with single row of large curved spinose setae; cardo slender and elongate, slightly longer than stipes. Labium as Fig. 7; labial palpi elongate and stylate, appearing 2-articled, articles 1 and 2 indistinguishably fused (limit of primitive article 1 can be determined by presence of "twin pores" that are homologous to those found near the apex of labial article 1 in aleocharine taxa that do not have fused articles), modified and somewhat inflated setae limited to basal half of apparent basal article; ligula of prementum very short, entire, somewhat triangular, with pair of spinose sensory setae; 2 discal setae of prementum with bases close, separated by about width of their punctures; medial pseudopore field narrow, without pseudopores. Mentum (Fig. 8) with anterolateral angles produced as prominent spinose processes. Pronotum strongly transverse, broadest at base, sides rounded, dorsal surface uniformly and broadly convex in cross section, posterior margin slightly bisinuate; hypomera strongly inflexed, not visible in lateral aspect. Elytra longer laterally than at suture; slightly longer than pronotum at suture, postero-lateral angles strongly sinuate. Hind wings present, fully developed. Meso—metasternum as in Fig. 9, mesosternal process narrow, spiniform, acutely pointed, extended $\frac{2}{3}$ length of mesocoxal cavities, not attaining apex of very short metasternal process (Cameron, 1933, 1939 reports that the mesosternal process extends the entire length of the coxae, but this is incorrect); mesosternal process carinate medially, carina extended from apex of process to near base of mesosternum, but fading before attaining margin of mesosternum, carina especially prominent in apical half of mesosternal process so that apical half of mesosternal process distinctly carinaform; known species with relative lengths of mesosternal process: isthmus: metasternal process 9:3.5:1.5; mesocoxal cavities margined behind; mesocoxae narrowly separated. Middle and hind tibiae with a single large dark seta near middle. Tarsal segmentation appearing to be 1,1,5, with front and hind legs appearing to have a single elongate rod-like segment, subequal in length to tibia; in fact, tarsi of front and middle legs with first 3 basal articles fused into one very short, finely microsetose,

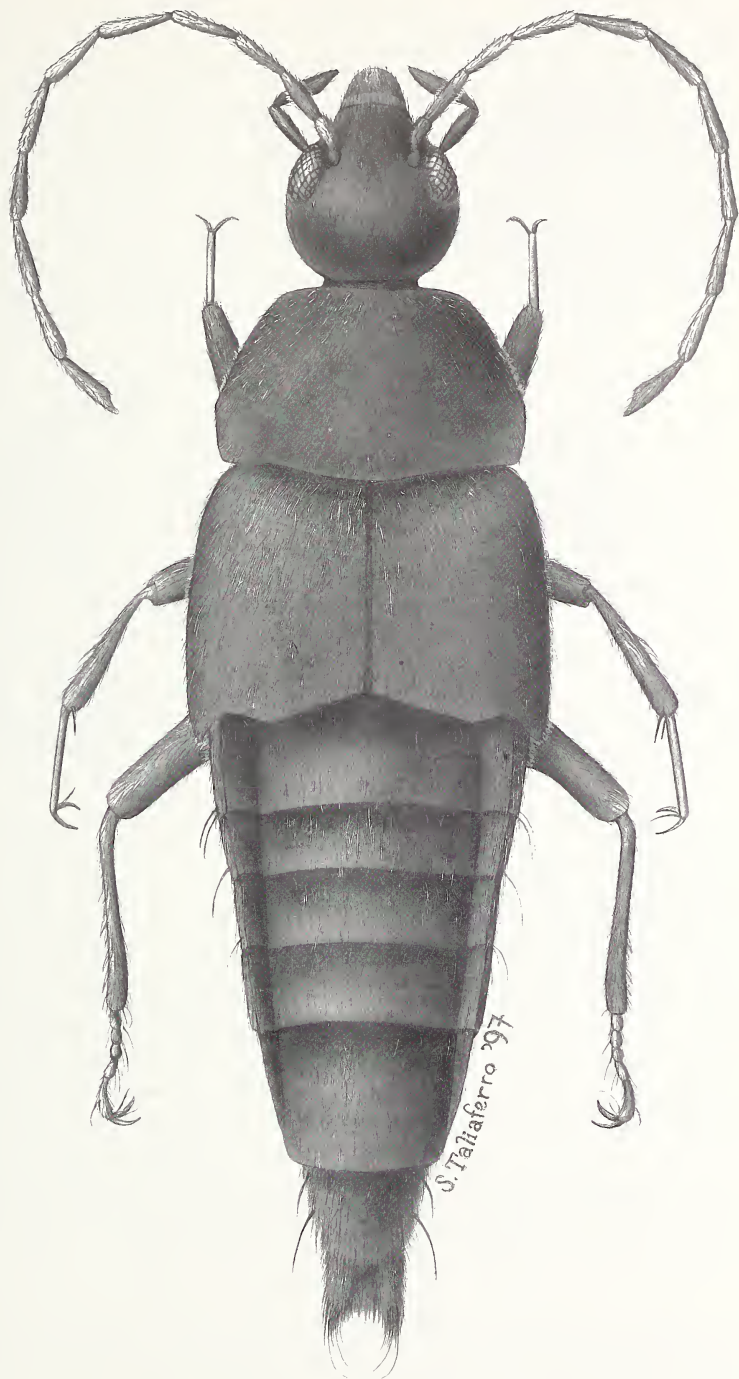
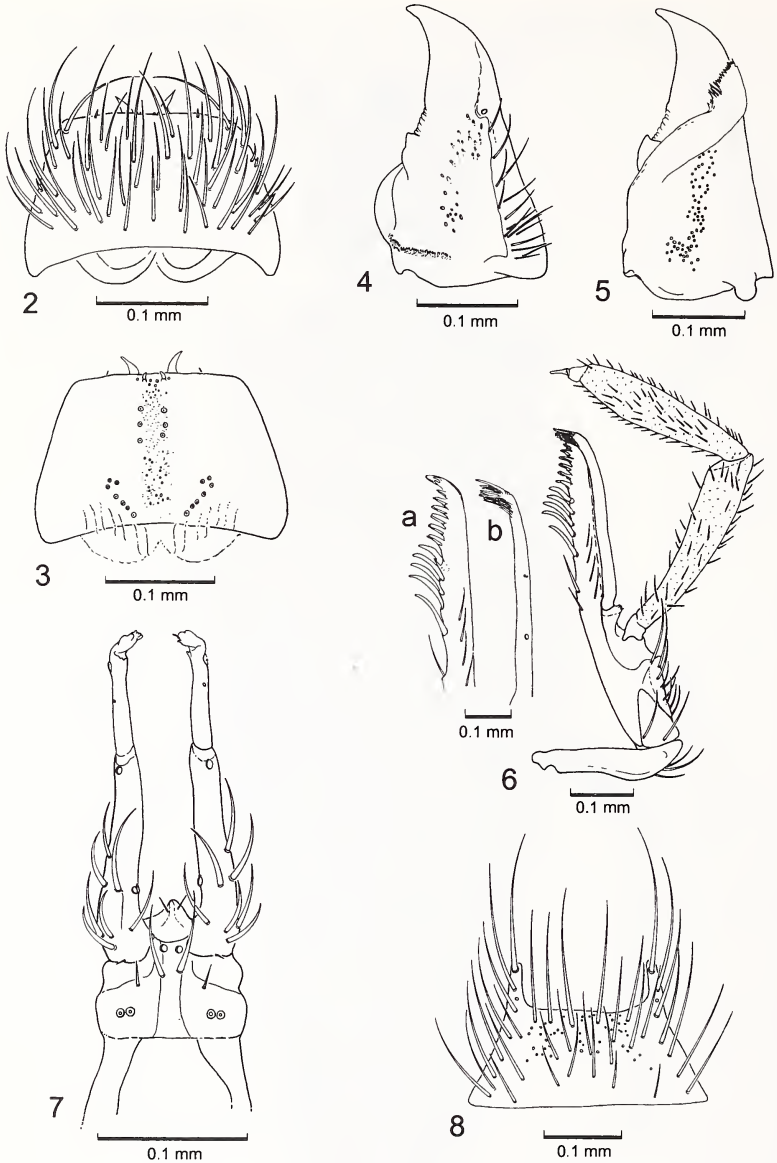
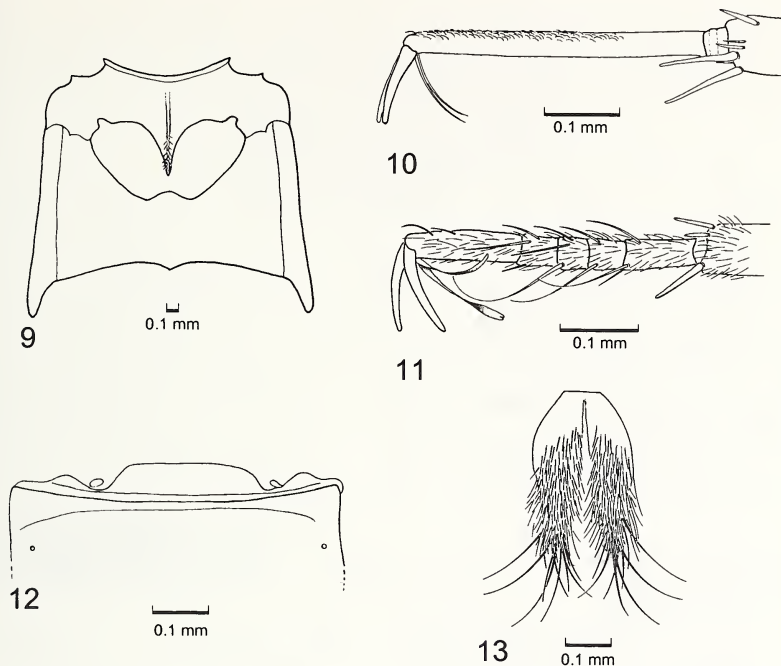


Fig. 1. *Dimonomera indica* Cameron, habitus, length 4.0 mm.



Figs. 2-8. *Dimonomera indica* Cameron. 2. Labrum, dorsal aspect. 3. Labrum, adoral aspect (epipharynx). 4. Right mandible, dorsal aspect. 5. Right mandible, ventral aspect. 6. Maxilla, dorsal aspect, a, lacinia detail, b, galea detail. 7. Labium, ventral aspect. 8. Mentum, ventral aspect.



Figs. 9–13. *Dimonomera indica* Cameron. 9. Meso-metasternum. 10. Middle tarsus. 11. Hind tarsus. 12. Abdominal tergum VII, anterior margin showing opening of tergal gland reservoir. 13. Abdominal tergum X.

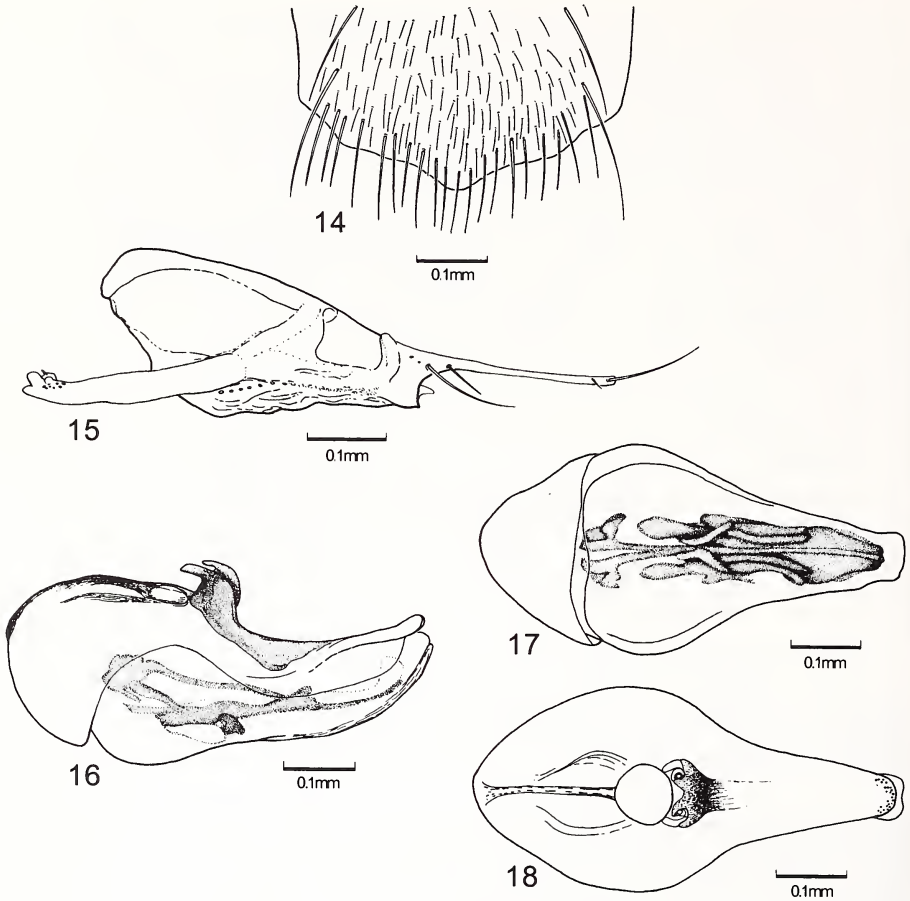
basal article less than 0.08 times length of rod-like article 4 (apparent second article) (Fig. 10). Hind tarsi (Fig. 11) with 5 articles, articles finely microsetose, article 1 slightly longer than 2+3 together, articles 2, 3 and 4 subequal in length, article 5 about as long as 2+3+4 together, longer than article 1. 2 empodial setae present (Cameron, 1933, 1939 incorrectly reports only one “slender appendage” between the claws), elongate, slightly longer than tarsal claws; empodial bristles of front and middle tarsi slender and setiform (Fig. 10), empodial bristles of hind tarsi flattened and subspatulate (Fig. 11). Hind coxae without ventral plate that covers base of femur and trochanter. Abdominal terga without transverse basal impressions. Anterior margin of abdominal tergum VII modified in conjunction with well-developed gland reservoir (Fig. 12). Abdominal tergum X divided by medial lightly sclerotized area into two lateral densely setose regions (Fig. 13).

Type Species. *Dimonomera indica* Cameron, 1933, by monotypy.

Dimonomera indica Cameron, 1933

Cameron 1933, p. 103; Cameron 1939, p. 14.

Description. Length 4.0 mm. Body uniformly dark brown, legs and antennae lighter (the color of the body and appendages of the type specimen is lighter than Cameron describes and may reflect changes resulting from the age of the specimen); closely,



Figs. 14–18. *Dimonomera indica* Cameron. 14. Male abdominal sternum VIII. 15. Paramere of aedeagus, lateral aspect. 16. Median lobe of aedeagus, lateral aspect. 17. Median lobe of aedeagus, ventral aspect. 18. Median lobe of aedeagus, dorsal aspect.

uniformly and finely microsetose with grayish pubescence; integument uniformly and finely reticulate, not shining. Antenna very long, reaching beyond posterior margin of elytra when extended posteriorly, all articles very elongate, each article 3.5–4.0 times longer than greatest width, basal articles very slightly longer than more apical articles, article 11 subequal in length to article 10. Prothorax transverse, about 1.6 times wider than long. Elytra slightly broader than base of pronotum, elytral length at suture about 1.1 times longer than pronotum at midline, lateral margins about 1.4 times longer than pronotum at midline; postero-lateral margins strongly sinuate.

Secondary Sexual Characteristics. Dorsal abdomen without apparent secondary sexual characteristics; posterior margin of male abdominal sternum VIII produced medially into very short and broad V-shaped lobe (Fig. 14).

Aedeagus. Parameres (Fig. 15) with very long, slender apical process with 4 setae, apical and basal setae large, subbasal seta medium sized and subapical seta minute. Median lobe (Figs. 16, 17, 18) with complex internal sclerites, and very large, paired, heavily sclerotized, hook-shaped processes for attachment of condylites of parameres.

Type. Holotype. ♂, with labels as follows: a small red, round "type" label; "Shugnu, 3000", Assam (14)", "Dimonomera indica Cam., TYPE", "M. Cameron, Bequest, BM 1955-147". In the collection of the Natural History Museum, London. Specimen is dissected; right middle and right hind leg and mouthparts are stored in glycerin in a genitalia vial pinned beneath the specimen; abdominal segments VII-X and the dissected aedeagus are in glycerin in a second genitalia vial pinned beneath the specimen. The remaining body parts including head, antennae and legs are glued onto the original specimen card.

Other specimens. No other specimens are known. Cameron (1933, 1939) seems to imply that there are other specimens available, reporting specimens from "Shugnu, alt. 3000 ft." and "Sarju Valley, alt. 5000 ft.". However, I only received the type specimen from the Natural History Museum, and Mr. Brendell noted (in litt.) that he sent all the specimens available.

Distribution. Known only from 3,000 feet elevation in the state of Assam in northwestern India (but see notes about other specimens above).

PHYLOGENETIC RELATIONSHIPS

Structural features of *Dimonomera* were compared with known members of the tribe Myllaenini, especially with *Myllaena*, the type genus of the tribe. *Dimonomera* shares the following characters with members of the Myllaenini:

1. Labrum semicircular with numerous, uniformly distributed setae and similar sensory elements medially (Fig. 2).
2. Lacinia elongate, stylate, with widely dispersed teeth and spines in apical third, each spine emerging from a socket between spinose scales (Fig. 6a).
3. Galea elongate, very slender, sclerotized to apex, with enlarged sensory scales and setae only at apex, without setae on mesal margins (Fig. 6b).
4. Cardo elongate, about as long as stipes (or longer in *Dimonomera indica*) (Fig. 6).
5. Maxillary palpus 4-articled, very long, article 3 spindle-shaped; article 4 very small, no longer than width of article 3 at apex (Fig. 6).
6. Labial palpi elongate and stylate, articles 1 and 2 fused, setae limited to basal half of apparent article 1 (Fig. 7). (Note that Klimaszewski 1982 interpreted the labial palpi of myllaenines to be absent, and the "glossae" to be styliiform; however this interpretation is incorrect. The setae, sensory pores, relative position and remaining sutures on the labial palpi of *Myllaena* can be directly homologized with those of other aleocharine staphylinids.)
7. Ligula of prementum short, entire (very short and sub-triangular for *Dimonomera*), with a pair of medial sensory setae (Fig. 7).
8. 2 discal setae of prementum, bases close.
9. Medial pseudopore field without pseudopores (Fig. 7).
10. Mentum with apico-lateral margins produced into spinose processes (Fig. 8).

11. Two empodial setae, at least some modified—flattened and subspatulate (Fig. 10, 11).
12. Setose areas of abdominal tergum X divided into 2 setose lobes by a medial unsclerotized region (Fig. 13).
13. Apical process of paramerite of paramere very elongate and slender with 4 setae (4 setae is the primitive condition in the Aleocharinae) (Fig. 15).

Of these similarities, the detailed structure of the galea and lacinia of the maxilla, detailed structure of the labial palpi, spinose processes on the apico-lateral margins of the mentum, and presence of 2 flattened and subspatulate empodial setae (at least on the hind tarsi), are features that are unique to the Myllaenini as far as is known (somewhat similar features occur individually in a few other aleocharines, but the detailed structure differs, suggesting that they are not homologous with those of the Myllaenini). These features are probably synapomorphies for members of this tribe. The other characteristics mentioned are, in combination, very distinctive for the Myllaenini, but they occur in various combinations in other groups of aleocharines, and their status as possible synapomorphies for the Myllaenini cannot be properly evaluated except in the context of a more comprehensive phylogenetic study (currently in progress by the author and Dr. Kee-Jeong Ahn).

In addition, the unique tarsal structure of *Dimonomera* appears to be a modification of the 4-4-5 segmentation typical of members of the Myllaenini. The very short basal segment on the front and middle tarsi appears to be made up of 3 very shortened and fused articles—the divisions between the articles are faintly visible when examined at high magnification with Differential Interference compound optics. Other features shared (not uniquely) between *Dimonomera* and the genus *Myllaena* include the fusiform body form with very similar pubescence and microsculpture and the emarginate apex of abdominal tergum 10 so that tergum 10 is bilobed (see Klimaszewski 1982).

Though the limits of the Myllaenini are still uncertain and are currently under investigation by the author and his colleagues, it seems clear *Dimonomera* is an aberrant myllaenine. It shares numerous uniquely derived characters with known members of the Myllaenini. Indeed, *Dimonomera* differs from other myllaenines (especially the type genus *Myllaena*) primarily in the unusual tarsal structure. This feature is strictly an autapomorphy, and is an insufficient criterion for establishing a tribe exclusively to include *Dimonomera*. The results of this study support Seevers' (1978) proposal that *Dimonomera* should be included in the Myllaenini.

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